

STEREO CONDENSER MICROPHONE    S M    2 c  
DOUBLE CONDENSER MICROPHONE    S M    2 3 c



SM 2 - SM 23 - 910-02-01

## A P P L I C A T I O N

The Stereo Condenser Microphones SM 2c and SM 23c are top flight studio microphones. They feature the outstanding qualities inherent in condenser microphones and their great versatility enables them to be used for solving the most complex recording problems.

Both microphones can be applied to a wide range of recording techniques. Since they contain, effectively, two single microphones in one unit, they may be used for various special applications. They were developed to stereophonic recordings, in particular for the "intensity system" but they can also be used advantageously, when two microphones of different directional characteristics are required in the same position.

## F E A T U R E S

The stereo microphones SM 2c and SM 23c comprise a microphone capsule assembly containing two capsules mounted closely one above the other and an ampli-



fier section containing two microphone preamplifiers. One power supply unit is needed with the SM 2c, while the SM 23c is connected in such a way that it is supplied from two separate power supply units. This enables the SM 23c to be used as a "double" microphone with extremely high reliability. A further advantage of the SM 23c is that it can be supplied from the fixed power supply units type N 52t.

In appearance and in performance the two microphones SM 2c and SM 23c are identical.

## TECHNICAL DETAILS

Each capsule consists of two fixed electrodes firmly screwed together and suitably drilled and two friction damped diaphragms. Each capsule, therefore, contains a system of two units, each with cardioid response. "Omni-directional", "Cardioid" and "Figure-of-eight" response curves can be obtained by switching the connections and by altering the polarity of the DC-bias voltage. The response curve of each individual system can be set from the power supply unit without affecting the other one.

The upper microphone system should be offset at an angle of  $270^\circ$  to the lower one. The direction of operation is radial to the microphone.

Each microphone capsule has its own amplifier. The two amplifiers are mounted side by side in the housing. They are effectively screened from one another. The output transformers are astatically wound and therefore insensitive to hum fields. The output impedance of the amplifier is normally 200 ohms but it can also be connected for 50 ohms. In this case the output voltage of the microphone is reduced by 6 dB. Microphones connected for 50 ohms are marked with a red dot beside the number plate.

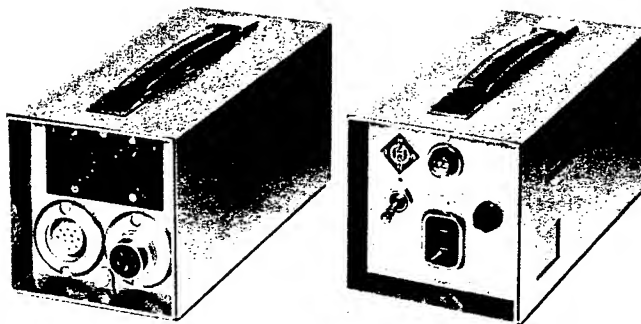
A calibrating voltage can be applied to the input of either of the amplifiers in the SM 2c and SM 23c via the special test head Z 57.

For MS-recordings a matrixing converter (SU 2t) has to be used. Special connection diagrams are supplied with it and should be observed carefully.

## STANDARD ACCESSORIES

### Power Supply Unit NSMa

The portable power supply unit NSMa is exclusively for the supply of one stereo microphone SM 2c from AC mains. The heater and plate voltages of the power supply unit are stabilised and therefore independent of mains voltage fluctuations. The two switches on the front panel of the power supply unit are for switching the directional characteristics of the microphones. The SM 2c is connected to the power supply unit via a twelve-pole socket B T 3618 and the connection to the mains is made via a mains socket. The audio output connector is a five-pole socket M T 3085.



NSMa 23

For supplying one stereo microphone SM 23c from one power supply unit, the NSMa 23 is available.

### Plug-In Power Supply Unit NSK

The power supply unit NSK is also intended to supply a microphone type SM 2c and its circuit corresponds to that of the portable power supply unit NSMa. It is constructed as a twin plug-in unit for fixed studio installation. Up to five of these units may be fitted, side by side, into one plug-in shelf, type S 167/10. The power supply unit NSK can also be used for supplying a miniature condenser microphone, by making suitable connections to the input socket. However, it is not advisable to connect 2 microphones simultaneously since this results in a ground loop which might lead to hum pick-up.

### Power Supply Unit NN 48b

Two supply units are needed to feed a double microphone type SM 23c from the mains. The portable power supply units NN 48b are suitable for this purpose. These units also provide stabilised heater and plate voltages; the connections to the microphone are made via an 8-pole socket type B T 3053. The mains input socket is of the standard equipment type, and the audio output connector is a 3-pin socket type M T 3081. The directional characteristics of the microphone are set up by means of a potentiometer. This power supply unit is also equipped for feeding a miniature condenser microphone.

### Plug-In Power Supply Unit      N 52t

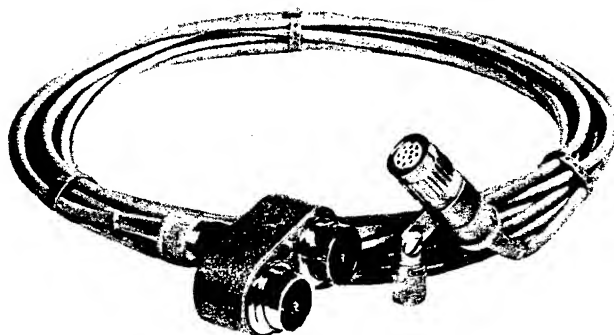
The double microphone SM 23c can also be supplied from two power supply units type N 52t. The specifications of this unit correspond to those of the portable power supply unit NN 48 b. The N 52t is a single plug-in unit intended for fixed studio installations. A plug-in shelf type S 167/10 will house up to ten of these units, side by side in a rack. A knob on the front panel of this mains unit, below the locking handle is for setting up the directional characteristics of the microphone.

### Battery Supply Unit      BB 50

In the absence of mains the double microphone SM 23c may be fed from two battery units type BB 50. This unit is fitted with a four-element airtight DEAC steel accumulator and a transistor DC converter. The mechanical construction and the technical specifications of this unit correspond to those of the portable power supply unit type NN 48b. It is also fitted for feeding a miniature condenser microphone. The directional characteristics of the microphone are controlled by means of a switch.

### Interconnection Cables SC 1, SC 2 and C 26

#### Adapter Double Plug Z 10.



The stereo microphone SM 2c is connected to the power supply unit NSMa by means of an interconnection cable type SC 1 or SC 2. Both cables have a standard length of 10 meters and are fitted with the Plugs T 3615 and T 3616. The cable SC 2 is also fitted with a universal coupling link for screwing onto stands with 1/2" and 5/8" (27 TPI) threads.

SC 2 und Z 10

For connecting the double microphone SM 23c to its two power supply units an adapter double plug type Z 10 is needed. This adapter has one 12-pole connector type B T 3618 and two 8-pole connectors type M T 3052. The microphone is connected to the adapter by means of a cable type SC 1 or SC 2. Two cables, type C 26 link the adapter to the two power supply units. This cable also has a standard length of 10 meters and is fitted with two 8-pole connectors type T 3050 and T 3051.

## SPECIAL ACCESSORIES

- M 31 Microphone floor stand with 1/2" and 3/8" screw studs.
- Z 10 Adapter double plug for the microphone SM 23c with one 12-pole connector type B T 3618 and two 8-pole connectors type M T 3052.
- Z 11 Adapter double plug for microphone type SM 23c with one 12-pole connector type B T 3618 and two 7-pole connectors type M T 3470.
- Z 12 Adapter cable for power supply unit NSMa with one 5-pole connector type T 3084 and two 3-pole connectors type T 3079.
- Z 42 Elastic suspension for microphones SM 2c and SM 23c.
- Z 43 Wind shield for SM 2c and SM 23c.
- Z 39 Test capacitance for SM 2c.
- Z 57 Test head for SM 2c and SM 23c.
- SU 2t Portable matrixing converter for SM 2c and SM 23c.

## TECHNICAL DATA

### Microphones SM 2c and SM 23c

Acoustical system .....	Two units each comprising two pressure gradient transducers electrically switchable for "omni-directional", "cardioid" or "figure-of-eight"
Frequency range .....	40 ... 16 000 cps.
Output levels .....	1 mV/ $\mu$ b across 1 000 $\Omega$ ("omni-directional", "cardioid" and "figure-of-eight")
Channel separation .....	$\geq 45$ dB
Electrical load resistance	$\geq 1\ 000$ (250) $\Omega$
Electrical source resistance.....	200 (50) $\Omega \pm 20\%$
Capacitance of microphone capsule .....	4 x ca. 35 pF
Stray voltage.....	$\leq 15\ \mu$ V
Noise voltage.....	$\leq 5\ \mu$ V $\hat{=}$ 28 phon (measured according to DIN 45405)

Maximum sound pressure  
for .5 % harmonic distortion  
at 40, 1000 and 5000 cps....  $\cong 245 \mu b \hat{=} \text{ca. } 121 \text{ dB}$   
(dB above  $2 \times 10^{-4} \mu b$ )

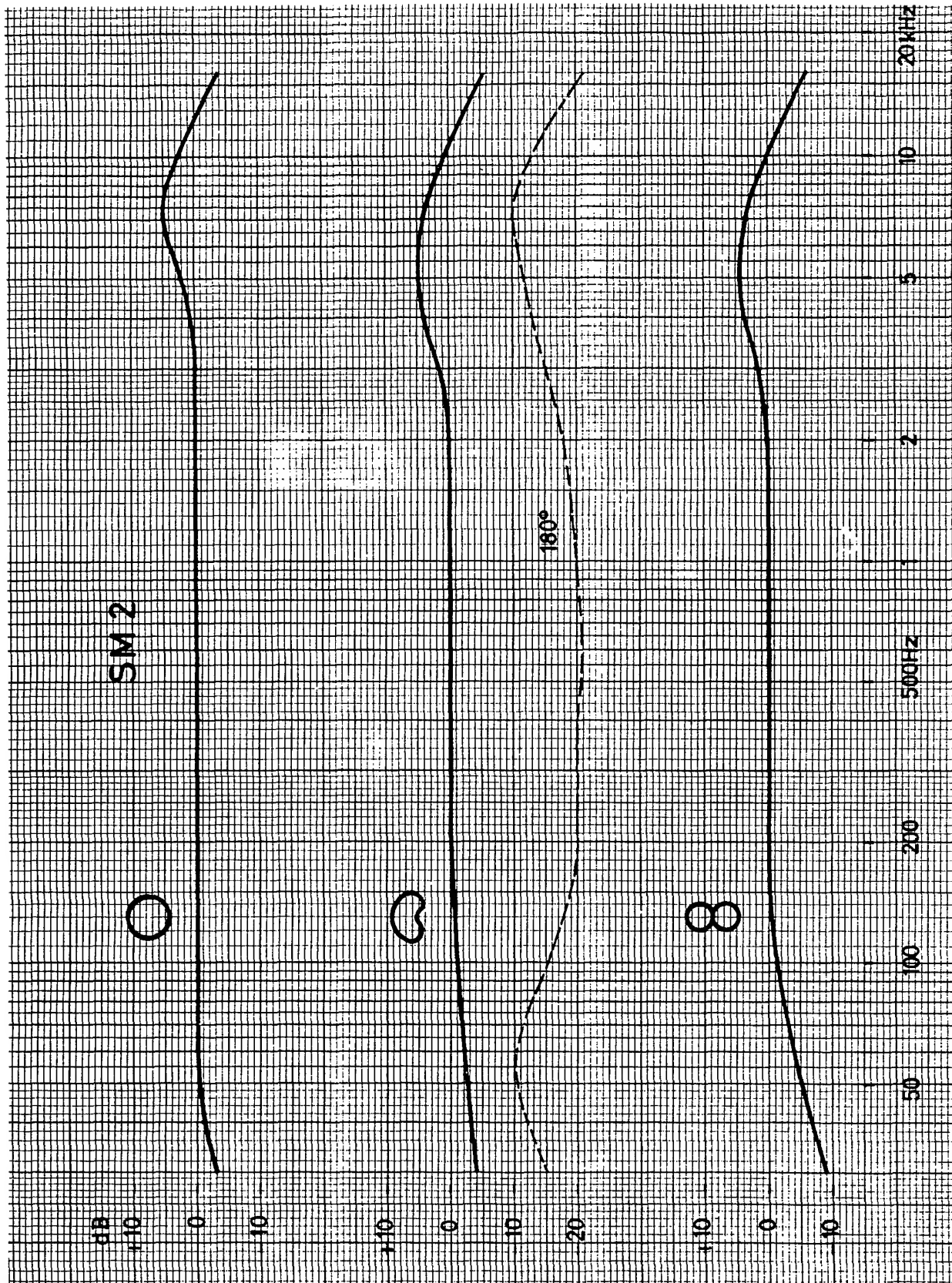
Gain of microphone  
amplifier..... - 1 dB  
Valves ..... 2 x AC 701k (Telefunken)  
Dimensions..... Length 210 mm; diameter 30 mm  
Weight..... 270 g

POWER SUPPLY UNIT NSMa

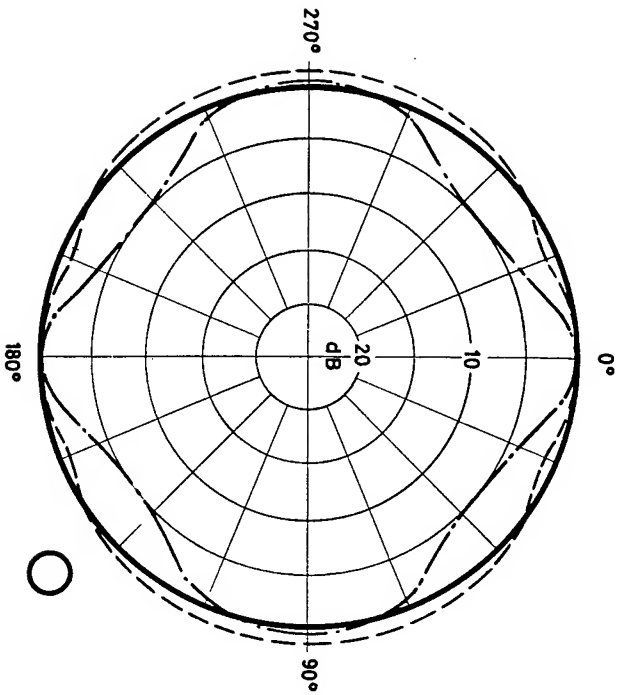
Mains voltage..... 117/127/220/240 Volts AC  $\pm 10 \%$   
Fuses..... .125 / .06 A  
mT according to DIN 41 571  
Power consumption..... 11 Watts  
DC outputs..... 120 V ( 1 mA)  
4 V (200 mA)  
0 ... 79 V  
Hum voltage.....  $\leq 10 \mu V$ ,  $\leq 8 \mu V$  resp.  
Pilot lamp..... Rafi 110 V No. 2855  
Dimensions..... 220 x 100 x 120 mm  
Weight..... 2.6 kg

POWER SUPPLY UNIT NN 48b

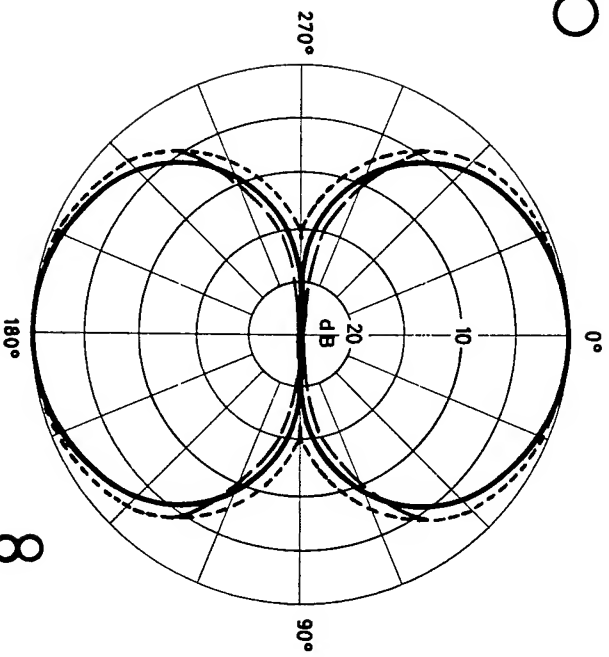
Mains voltage..... 117/127/220/240 Volts AC  $\pm 10 \%$   
Fuses..... .08 / .05 A  
mT according to DIN 41 571  
Power consumption..... 11 Watts  
DC outputs..... 120 V ( .5 mA)  
4 V (100 mA)  
0 ... 120 V  
Hum voltage.....  $\leq 10 \mu V$ ,  $\leq 8 \mu V$  resp.  
Pilot lamp..... Rafi 110 V No. 2855  
Dimensions..... 220 x 100 x 100 mm  
Weight..... 2,5 kg



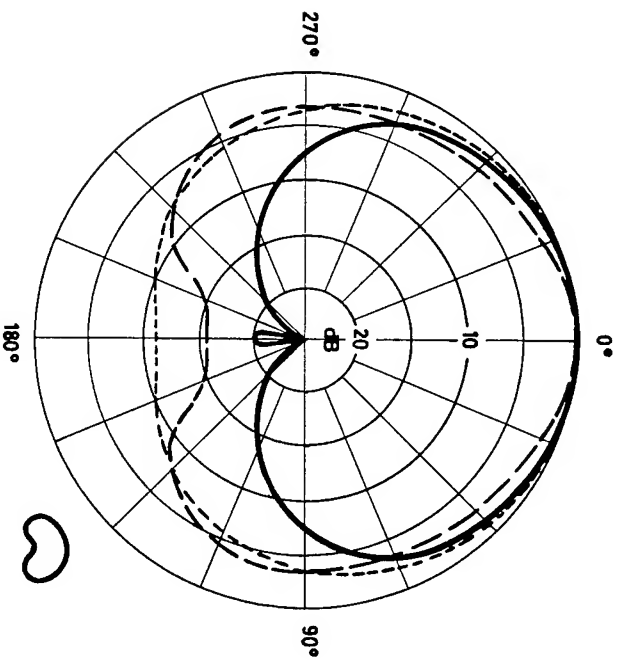
# SM 2



○



8



○

- 1000 Hz
- 100 Hz
- 10 000 Hz
- 15 000 Hz